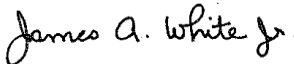


VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Tidewater Regional Office

INTRA-AGENCY MEMORANDUM

Engineering Analysis

Permit Writer	James A. White, Jr.
Air Permit Manager	Janardan R. Pandey
Memo To	Air Permit File
Date	DRAFT
Facility Name	Tyson Farms, Inc. - Temperanceville
Registration Number	40333
Application No.	023
Date Fee Paid	1-8-2021
Amount (\$)	\$11,192.00
Distance to SNP (km)	>100
Distance to JRF (km)	>100
FLM Notification (Y/N)	No
Application Fee Classification (Title V, Synthetic Minor, True Minor)	Title V
Permit Writer Signature	
Permit Manager Signature	

I. Introduction

Tyson Farms, Inc. (Tyson) is a poultry processing and rendering facility located in Accomack County. Operations consist of slaughtering, de-feathering, evisceration, chilling, and final packaging and shipping of chicken. The protein conversion operations consist of rendering poultry offal, parts, blood and feather into useable products, which include poultry meat meal, poultry fat, and feather meal. Currently, Tyson has two effective permits: a minor NSR (Article 6) permit issued on June 26, 2018 and a Title V permit issued November 27, 2013. As this is not a new stationary source or major modification, a Local Governing Body Certification form is not required.

In 2017, Tyson requested a facility-wide NO_x emission limit of 99 tons per year and a fuel limit for propane, but in discussions with DEQ it was decided more detail would be required in the permit to ensure that NO_x emissions would not exceed the 100 ton per year Title V threshold. In October of 2017, DEQ discussed with Tyson the need to have enforceable short term limits in terms of an emission factor or lb/hr and a long term tracking limit, i.e. fuel combusted, per emission source that contributed to NO_x emissions. All other pollutants were under 100 tpy and did not require hourly or fuel combusted limits. The Tidewater Regional Office received a Form 7 application from the source on **December 4, 2020** to request a change in the permitted facility wide limit for NO_x emissions to 95 tons per year for the total combined consumption of natural gas (NG) and propane fuels, and diesel fuel usage from the engine-generators and fire water pump. The application was considered complete on January 8, 2021.

II. Emission Unit(s) / Process Description(s)

In order to include all potential NO_x emitting emission units located at the facility, it was necessary to include several emissions units to the facility's NO_x emitting equipment list, which previously had not triggered minor NSR permitting (were categorically exempt per 9VAC5-80-1105(B) of the Regulations). Tyson identified these emissions units in the Form 7 application as:

- Miscellaneous small gas-fired combustion units (i.e. space heaters, hot water heaters, boilers etc.) - (Ref. No. SCU);
- Two 12.5 MMBtu/hr gas-fired water heaters - (Ref. Nos. PH1 and PH2);
- John Deere diesel-fired emergency generator - (Ref. No. PG2); and
- Perkins diesel-fired emergency fire pump - (Ref. No. PG3).

Uncontrolled emission rate increase (UEI) calculations that are performed to determine minor NSR permitting applicability do not include emissions from emissions units that are categorically exempt under 9VAC5-80-1105(B), unless it is requested such units be opted into the permit as allowed under 9VAC5-80-1100(C)(3). With this action, the exempted (categorical) emissions units listed above were included as permitted equipment, whereby allowing them to be combined with the facility's seven permitted propane/NG-fired boiler units (Ref. Nos. PB1 through PB3 and RB1 through RB4) to comprise an emission unit inventory that have NO_x emissions associated with their operations. The following table lists these NO_x emitting emission units:

Ref. No.	Equipment Description	Rated Capacity
PB1	Cleaver Brooks propane/NG-fired boiler	14.7 MMBtu/hr
PB2	Cleaver Brooks propane/NG-fired boiler	6.3 MMBtu/hr
RB1	Cleaver Brooks propane/NG-fired boiler	29.3 MMBtu/hr
RB2	Cleaver Brooks propane/NG-fired boiler	29.3 MMBtu/hr
RB3	Cleaver Brooks propane/NG-fired boiler	29.3 MMBtu/hr
RB4	Cleaver Brooks propane/NG-fired boiler	29.3 MMBtu/hr
SCU	Small propane/NG-fired combustion units	70.098 MMBtu/hr
PH1 & 2	Two propane/NG-fired hot water heaters	12.5 MMBtu/hr (each)
PG1	Katolight diesel engine-generator	1,490 hp
PG2	John Deere emergency diesel engine-generator	190 hp
PG3	Perkins emergency diesel fire pump	67 hp

The facility requested that the June 26, 2018 minor NSR permit be amended to limit NO_x emissions from the above combined emissions units to no more than 95 tpy, based on a rolling 12-month basis. In order to enforce the requested facility wide annual NO_x emission limit, DEQ used the following approach. The emergency diesel engines (Ref. Nos. PG1, PG2, and PG3) were separated from the combined NO_x emissions units to determine what their NO_x emissions would be based on the maximum 500 operating hours per year allowed for emergency engines. The combined NO_x emissions from these three emergency diesel engines were calculated to be 6.8 tpy (see attachment **40333_Tyson Farms Emergency Diesel Engines at 500 hrs.xlsx**). Next, the 6.8 tpy NO_x emissions from the emergency diesel engines were subtracted from the 95 tpy limit to yield 88.2 tpy of NO_x emissions to be allocated for the operation of the remaining NO_x emission units.

Because the remaining NOx emissions units were capable of burning either propane (currently used) and natural gas (future use) fuels, the facility requested the flexibility to use both gaseous fuels, until such time as all the combustion units burn natural gas only. In order to achieve this flexibility in using both gases, it was necessary to develop a relationship (mathematical equation) that would limit the annual throughput of the two fuels such that the facility wide 88.2 tpy NOx limit would not be exceeded.

Using the current DEQ boiler worksheet, it was determined that 13,569,230 gallons of propane (at 91,500 Btu/gal) and 1,764,000,000 cubic feet of natural gas (at 1,034 Btu/ft³) would each result in 88.2 tons of NOx emissions when combusted. Using this numerical relationship equations were developed to determine the amount of each fuel that could be consumed when both fuels were consumed in the same consecutive 12 month period. The equations are as follows:

Gallons of propane fuel = $[13,569,230 - (0.007692307 \times (NG))]$ where:
(NG) is the total amount of NG in cubic feet, burned by the emission units.

Cubic feet of natural gas = $[1,764 \times 10^6 - (130.00 \times (\text{Propane}))]$ where:
(Propane) is the total amount of propane fuel in gallons, burned by the emission units.

III. Regulatory Review

A. 9VAC5 Chapter 80, Part II, Article 6 - Minor New Source Review

The provisions of Article 6 apply throughout Virginia to (i) the construction of any new stationary source, (ii) the construction of any project (which includes the affected emissions units), and (iii) the reduction of any stack outlet elevation at any stationary source. A project is defined (9VAC5-80-1110(C)) as any change at an existing stationary source consisting of the addition, replacement, modification, or any combination of these changes to one or more emission units. A modified unit must have a physical change or change in the method of operation of that unit which increases the uncontrolled emission rate of any regulated air pollutant emitted into the atmosphere by the unit or that results in the emission of any regulated air pollutant into the atmosphere not previously emitted.

As previously stated, the applicant has submitted a request to change the facility wide NOx emission limits for NOx emitting emission units located at the facility. The requested change does not meet the definition of a project and therefore the provisions of Article 6 regulations are not applicable to the requested change.

B. 9VAC5 Chapter 80, Part II, Article 8 and Article 9 - PSD Major New Source Review and Non-Attainment Major New Source Review

Accomack County is a PSD area for all pollutants as designated in 9VAC5-20-205. The facility is in the 250 ton per year (tpy) major stationary source category. Per 9VAC5-80-1605, Article 8 applies to the construction of a new major stationary source or a project at an existing major stationary source. According to 9VAC5-80-1615(C), a project is defined as “a physical change in, or change in the method of operation of, an existing major stationary source.” This request does not meet the criteria of 9VAC5-80-1605; therefore, Article 8 does not apply.

After issuance of this permit, the facility does not have the potential to emit any regulated NSR pollutant at major stationary source thresholds.

C. 9VAC5 Chapter 80, Part II, Article 5 - State Operating Permit (SOP)

Tyson currently operates under an amended minor NSR permit issued on June 26, 2018 and a Title V permit issued November 27, 2013. The source desires to limit its facility wide NO_x emissions to under 100 tpy and operate as a synthetic minor source so as not to require a Title V permit. The facility has proposed that a facility wide NO_x emissions limit of 95 tpy be used to achieve this synthetic minor status. This requested change does not qualify as a project and will be accomplished by way of an SOP which will be combined with the facility's existing minor NSR permit. Public participation requirement to make this permit action federally-enforceable are discussed in Section XI below.

D. 9VAC5 Chapter 50, Part II, Article 5 - NSPS

New Source Performance Standard (NSPS) Subpart Dc:

NSPS Subpart Dc applies to facilities with a maximum design heat input capacity from 10 MMBtu/hr to 100 MMBtu/hr that are constructed, modified, or reconstructed after June 9 1989. Of the seven boilers, RB4 is the only unit that meets these applicability criteria; the other units were constructed prior to the applicability date. RB4 is subject to the reporting and record-keeping requirements of 40 CFR 60.48c. Virginia has accepted delegation to implement this rule for major sources as defined in 9VAC5-80-60 that are subject to Article 1 (9VAC5-50-410).

New Source Performance Standard (NSPS) Subpart IIII:

NSPS Subpart IIII applies to new, modified, and reconstructed stationary compression ignition (CI) internal combustion engines (ICE) that were ordered after July 1, 2005 and manufactured after April 1, 2006 or were modified/reconstructed after July 11, 2005. The diesel engines of the two generators (Ref. Nos. PG1 and PG2) and the emergency fire water pump (Ref. Nos. PG3) were manufactured in 1993, 2001, and 1999, respectively, and therefore pre-date the 40 CFR 60 Subpart IIII applicability date. Virginia has accepted delegation to implement this rule for major sources as defined in 9VAC5-80-60 that are subject to Article 1.

E. 9VAC5 Chapter 60, Part II, Article 1 - NESHAPS

No National Emissions Standards for Hazardous Air Pollutants (NESHAPS) apply to this permit action.

F. 9VAC5 Chapter 60, Part II, Article 2 - MACT

Maximum Achievable Control Technology Standard (MACT) Subpart JJJJJ:

MACT Subpart JJJJJ applies to industrial, commercial, or institutional boilers located at an area source of HAP. Per 40 CFR 63.11195(e), gas-fired boilers are not subject to any requirements in this subpart. Therefore, upon issuance of this permit, MACT Subpart JJJJJ does not apply to the seven boilers. Virginia has accepted delegation to implement this rule for major sources as defined in 9VAC5-80-60 that are subject to Article 1.

Maximum Achievable Control Technology Standard (MACT) Subpart ZZZZ:

MACT Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. The diesel engines of the two generators (Ref. Nos. PG1 and PG2) and the emergency fire water pump (Ref. Nos. PG3) are considered to be existing engines located at an area source for HAP emissions and therefore must meet the requirements of the MACT by complying with Table 2d of the rule. Virginia has accepted delegation to implement this rule for major sources as defined in 9VAC5-80-60 that are subject to Article 1 (9VAC5-50-410).

G. State Only Enforceable (SOE) Requirements (9VAC5-80-1120(F))

No SOE requirements apply as a result of this action. The permit does have existing SOE requirements for odor; however, these requirements are not affected by this permit action.

H. 9VAC5 Chapter 40, Part II, Existing Sources - Emission Standards

Article 1 - Visible Emissions and Fugitive Dust/Emissions (Rule 4-1):

Rule 4-1 applies to sources of visible emissions and sources of fugitive dust/emissions. Units constructed, modified, or relocated on or after March 17, 1972 are not subject to the rule unless the rule is more stringent than the provisions of 9VAC5-50, 9VAC5-80, or any permit issued pursuant to 9VAC5-80. PB2 and PB3 are subject to the opacity standards of 9VAC5-40-80.

Article 8 - Emission Standards for Fuel Burning Equipment (Rule 4-8):

Rule 4-8 applies to fuel burning equipment using gaseous fuel which have a maximum heat input of 10 MMBtu/hr or greater. Units constructed, modified, or relocated on or after March 17, 1972 are not subject to the rule unless the rule is more stringent than the provisions of 9VAC5-50, 9VAC5-80, or any permit issued pursuant to 9VAC5-80. PB1 and PB2 are subject to the PM and sulfur dioxide standards of 9VAC5-40-900 and 9VAC5-40-930, respectively.

I. Combination of Permit Program Requirements

The provisions of 9VAC5-80-1255 apply to this permit action because the action combines permits (minor NSR permit and SOP) into a single permit document. The combined permit document has the implementing program regulatory citation for each condition, has the most recent effective date of each condition, and notes that each condition is state and federally enforceable unless marked SOE (9VAC5-80-1255(D)(1-3)). Changes to permit terms and conditions to facilitate this combining action have been made in accordance with 9VAC5-80-1255(E) by updating the citations in each condition to the current authorities for each program. The combined permit document has the most recent effective date of each condition, and notes that each condition is state and federally enforceable unless marked SOE (9VAC5-80-1255D.1-3). The effective dates of the conditions in the draft permit are as follows:

“[June 26, 2018]” for those conditions in the June 26, 2018 minor NSR permit document that are not revised or affected by this permit action.

“[**DRAFT**]” for those conditions that are new or have been amended.

IV. **Best Available Control Technology Review (BACT)**

The changes resulting from this permit action do not constitute a new stationary source or a project; therefore, BACT is not applicable. The current BACT determinations for the boilers and the emergency diesel engines will remain in effect. In accordance with DEQ guidance, limits for pollutants where a unit has a PTE of less than 0.5 TPY were not included in the permit.

V. **Summary of Potential Emissions Increase**

The facility's change in potential to emit (PTE) is shown in the table below:

Pollutant	Past PTE (TPY)	Future PTE (TPY)	PTE Change (TPY)
NO _x	152.4	95.0	- 57.4
CO	88.3	76.6	- 11.7
SO ₂	1.5	10.3	8.8
PM	12.9	23.5	10.6
PM ₁₀	13.8	20.3	6.5
PM _{2.5}	11.3	12.2	0.9
VOC	37.7	27.0	- 10.7

VI. Dispersion Modeling

As shown in the table in Section V, the amendment does not cause an increase in PTE. Therefore, modeling is not required.

A. Criteria Pollutants

As shown in the table in Section V, the amendment will not cause an increase in the PTE.

B. Toxic Pollutants

Modeling is not required for an amendment that is exempt from the state toxics rule.

VII. Boilerplates and Boilerplate Deviations

The following boilerplates permit were used as a basis for the development of this draft permit document:

Combined permit template;
SOP Generic template;
Diesel Engine template; and
June 26, 2018 minor NSR permit.

VIII. Compliance Demonstration

Compliance for the facility wide 95 tpy NO_x emissions limit will be demonstrated by recordkeeping of the annual number of operating hours for the emergency diesel engines, calculated monthly as the sum of each consecutive 12-month period and the recordkeeping of annual throughputs for propane fuel (in gallons) and natural gas (in cubic feet) consumed by the emission units listed in Condition 19 of the permit, calculated monthly as the sum of each consecutive 12-month period.

IX. Title V Review - 9VAC5 Chapter 80 Part II Article 1 or Article 3

Tyson Farms, Inc. is currently a Title V major source due to a PTE greater than the applicable threshold (9VAC5-80-50(C)) for at least one regulated pollutant (NO_x pollutant). However, upon issuance of this permit the facility will no longer maintain a major source status and the source can request to have its Title V operating permit rescinded.

X. Public Participation and Notifications

Pursuant to 9VAC5-80-1020, as a result of the change in the case-by-case determination of the facility wide NOx emissions limitation, the draft permit must proceed through a public participation period of 30 days. Notice was published in the Eastern Shore News newspaper on Saturday, March 27, 2021. The comment period began on that day and ended on Monday, April 26, 2021.

XI. Other Considerations

None

XII. Recommendations

Approval of the draft permit is recommended.

Attachments

40333_Tyson Farms Emergency Diesel Engines at 500 hrs.xlsx
40333_Tyson Farms Propane-NG Fuel Burning Units Calcs.xlsx